TABLE 2.—*Free-air resultant winds based on pilot balloon observations made near 5 p. m., E. S. T. (2200 G. C. T.) during April 1947. Directions given in degrees from north (N=360°, E=90°, S=180°, W=270°). Velocities in meters per second*—Continued

Altitude (meters) m. s. l.	Oakland, Calif. (8 m.)			Oklahoma City, Okla. (396 m.)			Omaha, Nebr. (306 m.)			Phoenix, Ariz. (338 m.)			Rapid City, S. Dak. (982 m.)			St. Louis, Mo. (181 m.)			St. Cloud, Minn. (318 m.)			San Antonio, Tex. (240 m.)			San Diego, Calif. (13 m.)			Sault Ste. Marie, Mich. (225 m.)			Seattle, Wash. (116 m.)			Spokane, Wash. (603 m.)			Washington, D. C. (24 m.)		
	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity	Observations	Direction	Velocity
Surface	30	266	5.4	30	185	6.2	29	146	1.6	30	269	2.1	27	9	1.4	30	180	1.3	30	198	0.6	30	151	4.7	30	253	4.2	29	265	2.0	30	240	3.1	30	226	2.1	29	177	2.2
500	30	282	4.9	30	186	6.5	29	165	1.9	30	261	3.9	---	---	---	30	203	2.3	30	194	.8	30	152	5.9	29	267	3.7	29	265	2.3	30	238	3.0	---	---	---	29	200	2.6
1,000	30	297	2.9	30	189	7.5	26	199	2.4	30	249	5.0	27	8	1.3	29	220	4.0	29	192	1.6	30	163	5.5	22	308	2.9	28	217	2.9	30	234	3.3	30	238	4.1	29	238	2.7
1,500	29	320	3.2	28	207	8.0	24	235	4.1	30	239	5.6	27	349	1.0	26	235	6.7	28	277	1.9	30	165	6.2	21	323	3.0	27	208	3.8	29	228	3.4	29	235	4.4	28	268	2.9
2,000	27	334	2.8	23	218	8.1	20	251	6.8	30	230	5.8	26	214	1.9	19	254	8.7	23	262	2.9	29	173	5.9	20	305	3.1	22	218	2.9	26	228	3.7	27	245	5.3	24	271	4.5
2,500	27	306	2.7	22	236	8.2	18	264	8.9	30	228	6.7	24	241	5.1	19	264	9.4	17	270	4.0	28	182	5.4	19	286	4.4	22	238	4.5	21	240	2.6	26	249	5.5	22	283	6.0
3,000	27	310	3.0	19	246	8.9	16	274	11.6	30	233	8.1	21	254	7.7	17	273	9.7	16	258	5.4	27	190	4.1	19	267	5.2	21	258	6.9	18	267	2.6	22	247	5.2	22	290	7.5
4,000	26	315	6.3	19	261	10.2	13	280	15.0	30	239	8.8	17	263	11.5	14	268	11.6	14	266	9.3	24	198	3.8	18	256	7.6	19	278	8.8	12	292	3.8	13	262	5.8	18	280	10.9
5,000	24	312	9.1	17	270	11.6	13	273	15.7	28	252	9.8	14	262	11.6	11	268	9.5	---	---	---	22	210	2.9	15	245	10.3	16	305	8.7	10	265	4.8	13	264	7.3	16	275	12.4
6,000	23	311	12.0	15	274	11.1	12	266	19.5	26	249	9.7	11	263	12.6	---	---	---	---	---	---	17	223	4.2	15	246	10.4	11	307	12.7	---	---	---	---	---	---	13	277	13.2
8,000	15	292	12.8	---	---	---	---	---	---	21	252	12.0	---	---	---	---	---	---	---	---	---	14	238	5.5	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
10,000	---	---	---	---	---	---	---	---	---	16	263	17.7	---	---	---	---	---	---	---	---	---	11	263	6.0	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
12,000	---	---	---	---	---	---	---	---	---	10	255	22.6	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

TABLE 3.—*Maximum free-air wind velocities (m. p. s.) for different sections of the United States based on pilot balloon observations during June 1947*

Section	Surface to 2,500 meters (m. s. l.)					Above 2,501 to 5,000 meters (m. s. l.)					Above 5,000 meters (m. s. l.)				
	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station	Maximum velocity	Direction	Altitude (m.) m. s. l.	Date	Station
Northeast [1]	34.1	w.	1,810	1	Burlington, Vt.	41.1	w.	4,810	12	Caribou, Maine	65.0	ene.	10,167	22	Portland, Maine.
East-Central [2]	33.7	ssw.	1,154	2	Louisville, Ky.	35.8	w.	3,754	7	Huntington, W. Va.	54.0	nnw.	9,735	23	Huntington, W. Va.
Southeast [3]	22.5	s.	817	13	Charleston, S. C.	22.2	nnw.	4,927	28	Spartanburg, S. C.	56.0	nw.	11,611	23	Jacksonville, Fla.
North-Central [4]	54.6	ssw.	1,572	4	Marquette, Mich.	44.0	w.	4,627	29	Marquette, Mich.	70.0	sw.	11,828	13	International Falls, Minn.
Central [5]	46.2	sw.	2,229	4	Sioux City, Iowa.	38.4	wsw.	4,848	27	Lander, Wyo.	74.0	wnw.	12,299	26	Columbia, Mo.
South-Central [6]	35.4	ssw.	2,376	9	Tulsa, Okla.	34.5	ssw.	2,501	9	Tulsa, Okla.	59.2	wsw.	12,229	14	Little Rock, Ark.
Northwest [7]	29.4	wnw.	1,143	18	Ellensburg, Wash.	44.7	nw.	5,000	20	Medford, Oreg.	78.0	wnw.	11,561	20	Medford, Oreg.
West-Central [8]	36.2	wnw.	2,500	10	Denver, Colo.	52.0	nnw.	5,000	20	Red Bluff, Calif.	60.0	wnw.	5,605	10	Grand Junction, Colo.
Southwest [9]	35.0	ssw.	1,908	11	Winslow, Ariz.	52.0	ssw.	3,215	21	Albuquerque, N. Mex.	64.0	sw.	8,310	3	Albuquerque, N. Mex.

[1] Maine, Vermont, New Hampshire, Massachusetts, Rhode Island, Connecticut, New York, New Jersey, Pennsylvania, and northern Ohio.
[2] Delaware, Maryland, Virginia, West Virginia, southern Ohio, Kentucky, eastern Tennessee, and North Carolina.
[3] South Carolina, Georgia, Florida, and Alabama.
[4] Michigan, Wisconsin, Minnesota, North Dakota, and South Dakota.
[5] Indiana, Illinois, Iowa, Nebraska, Kansas, and Missouri.
[6] Mississippi, Arkansas, ouisiana, Oklahoma, Texas (except El Paso), and western Tennessee.
[7] Montana, Idaho, Washington, and Oregon.
[8] Wyoming, Colorado, Utah, northern Nevada, and northern California.
[9] Southern California, southern Nevada, Arizona, New Mexico, and extreme west Texas.

RIVER STAGES AND FLOODS FOR JUNE 1947

C. R. JORDAN

Precipitation during June was above normal over the greater part of the United States. Rainfall was particularly heavy in the central Mississippi and lower Missouri River Valleys. Two to four times the normal amounts for June fell in Iowa, Nebraska, Idaho, and Wyoming. It was drier than usual in the middle and southern Appalachians and over a broad strip extending across the southern part of the country, except for Louisiana, eastern Texas, and along the immediate south Atlantic Coast. Rainfall was below normal also in Nevada, western Idaho, and the eastern parts of Washington and Oregon.

Major floods occurred in the Central States. The severe and prolonged floods in the lower Missouri and central Mississippi Rivers were the worst in over 100 years. The Mississippi River at St. Louis, Mo. reached 40.3 feet, which was exceeded only by the flood of 1844. Several lives were lost and flood damage was tremendous. A report of the flood, with a table of flood stages for June, will be included in the July issue of the Review.

Drought conditions continued in the extreme Southwest, with water supplies critically short in some localities, according to the U. S. Geological Survey.

Locally heavy rainfall at Lake Charles, La., on June 19, produced local flooding. The heavy downpour of rain began at 5:50 a. m., and ended at 2:28 p. m. It was extremely limited in area and resulted from one continuous thunderstorm. Apparently the heaviest downpour occurred on the east side of the river almost directly over the city. The Mathieson Alkali Works, about 6 miles due west of Lake Charles, on the opposite side of the river, reported a total fall of only 6.25 inches. Cameron, about 40 miles south-southwest, reported a total of 0.22 inch during the day; Kinder, La. had 1.62 inches; Lafayette, 60 miles east, had a total of 0.19 inch. The highest wind recorded was 23 miles per hour from the north at 11:30 a. m., with an average velocity during the storm of 15 miles per hour from east-northeast, shifting to south and southeast near the end of the rainfall. The total fall at Lake Charles was 15.79 inches. There was considerable local flooding but the crest of the rise in the main river was 2 feet below flood stage.